

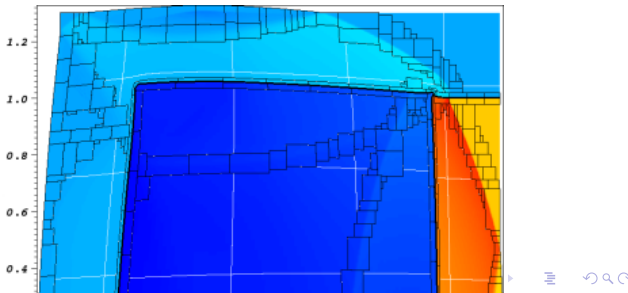
# Arbitrary Lagrangian-Eulerian Formulation with Adaptive Mesh Refinement

Kirsten Fagnan

LBNL - NERSC

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- ▶ ALE-AMR for gas dynamics first done at LLNL by Robert Anderson (R. Anderson, et al 2004)
- ▶ The addition of a material strength model happened recently (equations can be found in Wilkin's book) with void insertion proposed (Benson 2001 - great background paper)
- ▶ Current model also solves the diffusion operator using a finite element formulation, verified on heat conduction and radiation diffusion



# Surface Tension Equations

- ▶ First attempt - Advective Allen-Cahn equation, insufficient to drive droplet formation
- ▶ Will use Advective Cahn-Hilliard equation to model surface tension, must be solved with a fourth order operator. The advective component will be driven by the flow field solved for in the ALE-AMR equations.

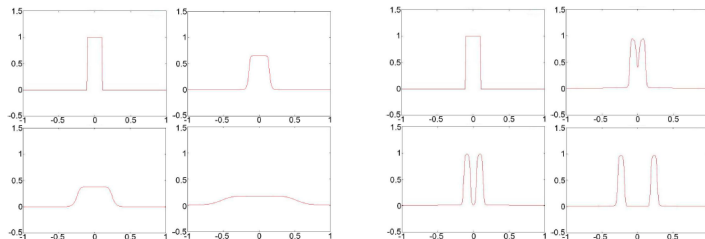


Figure: Courtesy of Liu and Bertozzi